National Integrated Heat Health Information System

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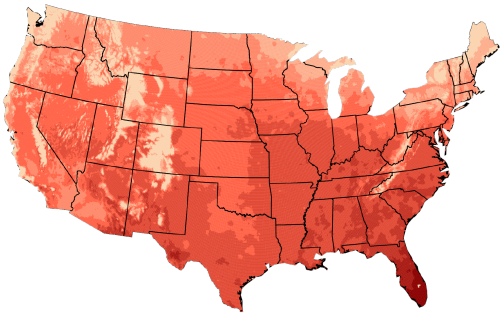
Leveraging the best-available science to eliminate health risks of extreme heat

U.S. summers are hot and they're getting hotter.

The 2019 summer was the hottest on record in the Northern Hemisphere, continuing a trend of record-breaking years.[1] The 4th National Climate Assessment (NCA 2018) projects that the trend will continue — heat waves will intensify, last longer, and span larger areas, causing more deaths and straining our nation's energy grid in the future.

The map on the right shows the projected change in the **number of days above 90°F** by the mid 21st century, in the higher emissions scenario (RCP8.5). Global annual average temperatures are projected to rise by 3°F – 12°F this century.[2] People's exposure to extreme heat is most acute in cities, where temperatures in some neighborhoods can get up to 17°F hotter than surrounding areas.[3]



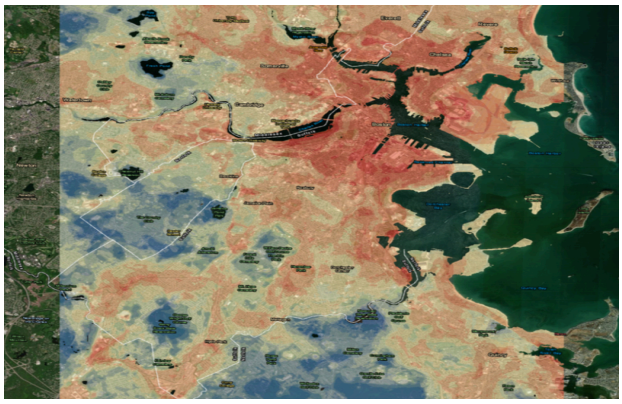
Projected **Change in Number of Days above 90°F** by 2050

0 10 20 30 40 50 60 70

Source: NCA 2018

Extreme heat diminishes human health and productivity, and it can kill.

Extreme heat kills hundreds of Americans annually and sends tens of thousands more to the hospital. It also worsens existing conditions (like asthma), saps labor productivity, contributes to chronic maladies (like kidney disease) in outdoor workers, and leads to declines in cognitive performance.[4]



In 2018-19, NIHHIS co-sponsored campaigns to map extreme heat in ten U.S. cities. Some parts of Boston (shown above) were 15°F hotter than other parts of the city. Red shows values up to 102°F.

Who is most at risk?

Children & Athletes

Older Adults

Outdoor Workers

More city officials are taking action, but say they need better information.

Demand for science-based information is large and growing. NIHHIS works with decision makers in cities and states across the country to co-produce actionable information needed to inform their planning processes. For example:

- urban planners are mapping heat islands and vulnerable populations to pinpoint and quantify exposure and risk[3];
- city officials are incorporating longer-term predictions into their early warning systems and heat-health action plans to reduce exposure and mitigate risk[5];
- emergency responders are envisioning extreme scenarios to anticipate cascading system failures during heat waves; and
- occupational health experts and athletic directors are developing new indicators to reduce heat risks to athletes, outdoor workers, and military personnel.[6]

What is NIHHIS & how it aims to serve the nation ⇨

References:

1. NOAA NCEI News Release (Sept. 16, 2019)
2. USGCRP (2018): 4th U.S. National Climate Assessment
3. Shandas, V. et al. (2019): *Climate*, doi:10.3390/cli7010005
4. EPA and CDC (2016): *Climate Change & Extreme Heat: What You Can Do to Prepare*, EPA 430-R-16-061
5. Jones, Hunter M. (2019): *BAMS*, doi:10.1175/BAMS-D-19-0042.1
6. Hosokawa Y. (2019): *Int. J. Biometeorol.*, doi:10.1007/s00484-019-01673-6

What is NIHHIS and how does it aim to serve the nation?

NIHHIS is an emerging **Integrated Information System** that, similar to NIDIS, aims to provide actionable, science-based information to help decision makers reduce exposure and manage their risks.

NIHHIS brings together researchers, experts from federal agencies, local decision makers, across disciplines (health care providers, emergency managers, city planners, and energy utilities) to **leverage the best-available science to eliminate health risks of extreme heat**.

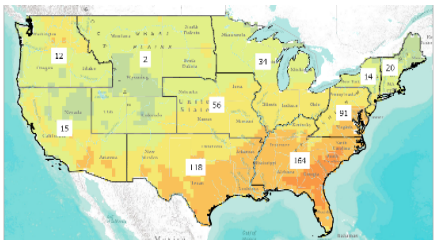
NIHHIS—comprised of a federal working group, pilot projects, and a network of partners—provides the following **five key functions** in service to the nation…

1. Define Demand

NIHHIS Decision Calendar Workshop in MA

NIHHIS builds and sustains **engagements** with partners and information consumers, using **decision calendars** to understand and map the pathways by which actionable information needs to flow from researchers to decision makers, and on what timescales.

2. Enhance Information



CDC-NOAA Experimental Heat Impacts Monitor

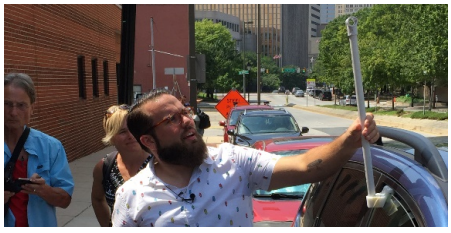
Based on user needs, the NIHHIS network seeks to **integrate and enhance** climate, weather, health, and other science-based information, to inform decisions with **timely, usable, and reliable decision support** for reducing heat's health risks at all timescales.

3. Promote Understanding

NIHHIS at the First Global Forum on Heat and Health

NIHHIS promotes **awareness and understanding** of extreme heat and its impacts on human health. Specifically, we invest in high-priority research, communicate findings, and build awareness and competency around the issue by cross-training partners and end users in the use of science-based tools and methods for measuring, mapping, and mitigating their exposure and risk.

4. Take Action & Evaluate



NIHHIS co-sponsored Urban Heat Island mapping citizen science campaigns in 10 U.S. cities

NIHHIS connects decision makers with world-class interdisciplinary experts to co-produce locally relevant, actionable information that is needed to inform local planning. Thus, NIHHIS is both a technological and cognitive bridge that coordinates interdisciplinary research, conducts **pilot projects**, and builds relationships across expert domains.

5. Observe & Monitor

NOAA-funded researchers releasing an ocean buoy

NIHHIS aims to leverage and extend investments in Earth-observing and bio-surveillance capabilities to determine:

- Where and how is exposure to extreme heat changing, and with what impacts on human health?
- To what extent have local actions taken reduced exposure and risk?

Who is in the NIHHIS federal partnership?

ASPR Assistant Secretary for Preparedness and Response · EPA United States Environmental Protection Agency · NIH NIEHS · NIOSH · SAMHSA Substance Abuse and Mental Health Services Administration · CDC Centers for Disease Control and Prevention · U.S. Department of Homeland Security FEMA · NOAA · OSHA®

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